

Health Interview Survey, United States, 2010-2014Table 1. Estimated proportion of adults aged ≥19 years who received selected vaccines,\* by age group and high-risk status† - National Health Interview Survey, United States, 2010-2014

	Unweighted sample size						Linear trend test p-value
	(2010-2014)	2010	2011	2012	2013	2014	<sup>\$</sup> Linear trend test p-value
Influenza - age ≥19 yrs	146,590	37.2	38.5	39.6	42.8	43.2	0.01
Pneumococcal - age 19-64 yrs, HR	44,479	18.5	20.1	20.0	21.2	20.3	0.01
Pneumococcal - age ≥65 yrs	34,640	59.7	62.3	59.9	59.7	61.3	0.77
Tetanus-toxoid (Td or Tdap) - age ≥19 yrs	155,651	62.0	62.6	62.4	62.0	62.2	0.87
Tdap - age 19-64 yrs	84,840	8.2	12.5	15.6	18.4	21.5	< 0.01
Tdap - age ≥65 yrs	15,430			8.0	11.9	14.0	< 0.01
Hepatitis A - age ≥19 yrs	143,313	8.1	9.1	8.9	9.0	9.0	0.04
Hepatitis B - age ≥19 yrs	147,781	25.9	27.0	27.1	25.0	24.5	< 0.01
Herpes zoster - age ≥60 yrs	47,915	14.4	15.8	20.1	24.2	27.9	< 0.01
HPV females - age 19-26 yrs	10,312	20.7	29.5	34.5	36.9	40.2	< 0.01
HPV males- age 19-26 yrs	7,348		2.1	2.3	5.9	8.2	< 0.01

pertussis vaccine. Abbreviations: HPV = human papillomavirus; HR = high risk; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

\* Influenza vaccination coverage for 2010 is coverage from the 2009-10 season, 2011 is coverage from the 2010-11 season, 2012 is coverage from the 2011-12 season, 2013 is coverage from the 2012-13 season, and 2014 is coverage from the 2013-14 season. Interviews from August through June of each season were used to estimate coverage from July through May using Kaplan Meier survival analysis. Tdap vaccination coverage data among adults aged ≥65 years are available beginning in the NHIS 2012 survey. The 2010 HPV vaccination coverage estimate among males is suppressed due to relative standard error > 30%.

told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or they were current smokers.† Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease (beginning in 2012), coronary heart disease, angina, heart attack, or other heart condition; had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or they were current smokers.

<sup>\$</sup> For influenza vaccination, tests for linear trend were performed using a weighted linear regression on the season-specific estimates, using season number as the independent variable and weights as the inverse of the estimated variance of the estimated vaccination coverage. For vaccination with the other vaccines, tests for linear trend were performed in SUDAAN using the RATIO procedure. Statistical significance was defined as p<0.05.

#### Surveillance of Vaccination Coverage Among Adult Populations - United States, 2014

Walter W. Williams, MD, Peng-Jun Lu, MD, PhD, Alissa O'Halloran, MSPH, et al.

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**Table 2. Estimated proportion of adults\* aged  $\geq 19$  years who received influenza status<sup>§</sup> – National Health Interview Survey, United States, 2010–2014**

	Unweighted sample size	
	(2010–2014)	2010
Influenza – age $\geq 19$ yrs	146,590	37.2
Influenza – age $\geq 19$ yrs, HCP	12,185	60.9
Pneumococcal – age 19–64 yrs, HR	44,479	18.5
Pneumococcal – age $\geq 65$ yrs	34,640	59.7

**Abbreviations:** HCP = health care personnel; HR = high risk.

\* Adults were classified as health care personnel if they reported they currently worked in a doctor's office, dentist's office, nursing home or some other health-care facility as well as professional nursing care provided in the home.

<sup>†</sup> Influenza vaccination coverage for 2010 is coverage from the 2009–10 season through June of each season were used to estimate coverage from July through June of each season; 2013 is coverage from the 2012–13 season, and 2014 is coverage from the 2013–14 season.

<sup>§</sup> Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease (beginning in 2010), other heart condition; had a diagnosis of cancer during the previous 12 months; had been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had an asthma episode or attack during the preceding 12 months; had an asthma episode or attack during the preceding 12 months.

<sup>¶</sup> For influenza vaccination, tests for linear trend were performed using a weighted logistic regression model with season number as the independent variable and weights as the inverse of the variance of the coverage. For vaccination with the other vaccines, tests for linear trend were performed using a weighted logistic regression model with season number as the independent variable and weights as the inverse of the variance of the coverage. For vaccination with the other vaccines, tests for linear trend were performed using a weighted logistic regression model with season number as the independent variable and weights as the inverse of the variance of the coverage. For vaccination with the other vaccines, tests for linear trend were performed using a weighted logistic regression model with season number as the independent variable and weights as the inverse of the variance of the coverage. For vaccination with the other vaccines, tests for linear trend were performed using a weighted logistic regression model with season number as the independent variable and weights as the inverse of the variance of the coverage.

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**za<sup>†</sup> and pneumococcal vaccines, by age group and high-risk**

				Linear trend test p- value <sup>‡</sup>
2011	2012	2013	2014	
38.5	39.6	42.8	43.2	0.01
56.6	61.5	67.3	65.4	0.17
20.1	20.0	21.2	20.3	0.01
62.3	59.9	59.7	61.3	0.77

ently volunteer or work in a hospital, medical clinic,  
cility including part-time and unpaid work in a health care

1, 2011 is coverage from the 2010-11 season, 2012 is coverage  
is coverage from the 2013-14 season. Interviews from August  
May using Kaplan Meier survival analysis.

ver been told by a doctor or other health professional that  
ng in 2012), coronary heart disease, angina, heart attack, or  
hs (excluding nonmelanoma skin cancer); had ever been told by

ey had chronic bronchitis or weak or failing kidneys during  
12 months; or were current smokers.

ighted linear regression on the season-specific estimates,  
f the estimated variance of the estimated vaccination  
re performed in SUDAAN using the RATIO procedure. Statistical

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**Table 3. Estimated proportion of adults aged  $\geq 19$  years who received a tetanus vaccine, by age group\* – National Health Interview Survey, 2010**

	Unweighted sample size	
	(2010–2014)	2010
Tetanus-toxoid (Td or Tdap) – age $\geq 19$ yrs	155,651	62.0
Tdap – age 19–64 yrs	84,840	8.2
Tdap – age $\geq 65$ yrs	15,430	
Tdap – age 19–64 yrs, HCP	8,604	22.0
Tdap – age $\geq 65$ yrs, HCP	592	

**Abbreviations:** HCP = health care personnel; Td = tetanus-diphtheria toxoid; Tdap = tetanus-diphtheria-acellular pertussis vaccine.

\* Tdap vaccination coverage data among adults aged  $\geq 65$  years are available beginning in 2011.

<sup>†</sup> For influenza vaccination, tests for linear trend were performed using a weighted logistic regression model, using season number as the independent variable and weights as the inverse of the variance of the coverage. For vaccination with the other vaccines, tests for linear trend were performed using a logistic regression model. Statistical significance was defined as  $p < 0.05$ .

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**s toxoid-containing vaccine (Td or Tdap) and proportion of  
urvey, United States, 2010–2014**

				Linear trend test p-value <sup>†</sup>
2011	2012	2013	2014	
62.6	62.4	62.0	62.2	0.87
12.5	15.6	18.4	21.5	< 0.01
	8.0	11.9	14.0	< 0.01
26.8	32.6	37.9	43.0	< 0.01
	16.9	30.7	28.7	0.03

Tdap = tetanus, diphtheria, and acellular pertussis

eginning in the NHIS 2012 survey.

ighted linear regression on the season-specific estimates,  
f the estimated variance of the estimated vaccination  
re performed in SUDAAN using the RATIO procedure.

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**Table 4. Estimated proportion of adults aged  $\geq 19$  years who received hepatitis A vaccine, National Health Interview Survey, United States, 2010-2014**

	Unweighted sample size  (2010-2014)
Hepatitis A - age $\geq 19$ yrs	143,313
Hepatitis A - age $\geq 19$ yrs, travelers	44,535
Hepatitis A - age $\geq 19$ yrs, non-travelers	98,543
Hepatitis A - age $\geq 19$ yrs, with chronic liver conditions	1,894
Hepatitis B - age $\geq 19$ yrs	147,781
Hepatitis B - age $\geq 19$ yrs, travelers	47,187
Hepatitis B - age $\geq 19$ yrs, non-travelers	100,337
Hepatitis B - age $\geq 19$ yrs, with chronic liver conditions	2,003
Hepatitis B - age $\geq 19$ yrs, HCP	12,654

**Abbreviations:** HCP = health care personnel; travelers = persons who had traveled to Europe, Japan, Australia, New Zealand, or Canada since 1995; nontravelers = persons who had not traveled to other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995.

\* For influenza vaccination, tests for linear trend were performed using a season number as the independent variable and weights as the inverse of the number of persons vaccinated with the other vaccines; for hepatitis A vaccination, tests for linear trend were performed using a season number as the independent variable and weights as the inverse of the number of persons vaccinated with the other vaccines, tests for linear trend were performed defined as  $p < 0.05$ .

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tis A and hepatitis B vaccines, by age group and high-risk status -

2010	2011	2012	2013	2014	Linear trend test p-value*
8.1	9.1	8.9	9.0	9.0	0.04
14.6	16.2	16.1	15.9	16.0	0.14
5.1	5.7	5.6	5.7	5.5	0.29
14.9	13.6	13.1	13.3	13.8	0.73
25.9	27.0	27.1	25.0	24.5	< 0.01
33.0	35.0	35.0	33.1	30.5	< 0.01
22.4	23.0	23.2	20.9	21.4	< 0.01
31.5	38.5	30.0	34.0	29.8	0.42
63.2	63.8	65.0	61.7	60.7	0.08

aveled outside the United States to countries other than countries in  
= persons who had not traveled outside the United States to countries  
ince 1995.

weighted linear regression on the season-specific estimates, using  
e estimated variance of the estimated vaccination coverage. For  
in SUDAAN using the RATIO procedure. Statistical significance was

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**Table 5. Estimated proportion of adults aged  $\geq 19$  years who received herpes zoster vaccine, by age group and sex, National Health Interview Survey, United States, 2010-2014**

	Unweighted sample size	
	(2010-2014)	2010
Herpes zoster - age $\geq 60$ yrs	47,915	14.4
HPV, females - age 19-26 yrs	10,312	20.7
HPV, males - age 19-26 yrs	7,348	

**Abbreviations:** HVP = human papillomavirus.

\* The 2010 HPV vaccination coverage estimate among males is suppressed due to small sample size.

† For influenza vaccination, tests for linear trend were performed using a weighted logistic regression model using season number as the independent variable and weights as the inverse of coverage. For vaccination with the other vaccines, tests for linear trend were performed using a logistic regression model. Statistical significance was defined as  $p < 0.05$ .

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oster and human papillomavirus\* vaccines, by age group -

2011	2012	2013	2014	Linear trend test p-value <sup>†</sup>
15.8	20.1	24.2	27.9	< 0.01
29.5	34.5	36.9	40.2	< 0.01
2.1	2.3	5.9	8.2	< 0.01

o relative standard error > 30%.

ighted linear regression on the season-specific estimates,  
f the estimated variance of the estimated vaccination  
re performed in SUDAAN using the RATIO procedure.

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